

920.08.14 Hose. Hose shall be 5/8 in. inside diameter corded synthetic rubber hose or as approved by the Engineer.

920.08.15 Turnbuckles. Turnbuckles shall be galvanized or cadmium plated with 4-1/2 in. openings and 5/16 in. threaded ends with screw eyes.

920.08.16 Anchors. Tree anchors shall be earth anchors of a type commonly used for anchoring large trees and as approved by the Engineer.

920.08.17 Wrapping Material. Wrapping material for trees shall be clean new burlap 6 to 7 oz/yd² in strips 4 to 6 in. wide.

920.08.18 Twine. Twine used for tying wrapping on trees shall be three ply untreated jute twine as approved by the Engineer.

920.08.19 Antidesiccant. Antidesiccant shall be an approved emulsion which will provide a film over plant surfaces permeable enough to permit transpiration.

920.08.20 Tree Wound Dressing. Tree wound dressing shall be an asphalt based emulsion prepared especially for tree pruning operations.

920.08.21 Pegs. Pegs shall be wooden wedges 1/2 x 1 x 6 in. to 1/2 x 1 x 12 in. as approved by the Engineer.

920.08.22 Water Absorbent Gel. Water absorbent gel shall be a cross linked polyacrylamide horticultural product used to maintain moisture around bare root plants and as a soil conditioner. Formulas used shall conform to the manufacturer's recommendations.

SECTION 921 — MISCELLANEOUS

921.01 WATER FOR CONCRETE MIXES. Water shall conform to the pH requirements of T 26, Method B and shall be clear. If questionable quality is suspected, the water shall conform to the limits of the comparison tests with distilled water as specified in T 26. The chloride concentration of water used in mixing and curing of portland cement concrete shall be determined in conformance with D 512 and shall not exceed the following limits:

Bridge Superstructure and Prestressed Concrete	500 ppm
Latex Modified Concrete	50 ppm
Other Concrete and Water Used in Curing	1000 ppm

921.02 MOISTURE AND DUST CONTROL AGENTS.

921.02.01 Calcium Chloride. Solid calcium chloride shall conform to M 144, Type S, Grade I, Class A. Calcium chloride in solution shall contain a minimum of 30 percent salts. The solution shall be made using potable water in a quantity designated by the Engineer. When analyzed in conformance with MSMT 601, the residue shall conform to M 144.

921.02.02 Magnesium Chloride. Magnesium chloride flakes shall conform to the following:

TEST PROPERTY	SPECIFICATION LIMITS
Magnesium Chloride $MgCl_2$, %	46.0 – 47.0
Calcium Chloride $CaCl_2$, %	2.0 – 3.0
Potassium Chloride KCl, %	0.5 – 1.0
Sodium Chloride NaCl, %	0.5 – 1.0
Sulfates, % max	0.05

Magnesium chloride, when used as a solution, shall contain 30 to 32 percent solids.

921.03 LIME.

921.03.01 Hydrated lime shall conform to the chemical requirements of C 206, Type N when used in finishing or C 207, Type N when used for masonry.

921.03.02 Hydrated lime for soil stabilization shall have a minimum combined calcium oxide and magnesium oxide content of 65 percent when tested as specified in C 25 and shall conform to the following gradation:

SIEVE SIZE	PERCENT RETAINED max
3/8 in.	0
No. 30	3
No. 200	25

921.03.03 Quicklime shall have a combined calcium oxide and magnesium oxide content of 75 percent minimum and a gradation of 100 percent passing the 3/8 in. sieve when tested as specified in C 25.

921.04 EPOXY ADHESIVES. Epoxy resin bonding material shall consist of a thermosetting epoxy resin and a hardener. The individual components of mixed epoxy shall not settle or skin and contain no volatile solvents, lumps, or foreign materials. The epoxy shall conform to C 881. Unless otherwise specified, epoxy adhesive used for bearing and expansion pads shall be nonsagging.

The manufacturer shall furnish certification as specified in TC-1.02. The certification or data sheet shall show actual test results for each required property of the type, grade, and class of epoxy submitted, and shall accompany each sample.

The manufacturer shall supply actual bond test results for each batch submitted for use.

921.05 STRUCTURAL TIMBER AND LUMBER. The manufacturer shall furnish certification as specified in TC-1.02. Structural timber and lumber shall conform to M 168.

921.06 TIMBER PRESERVATIVES. Preservatives and pressure treatment for timber shall conform to M 133.

921.07 CONDUITS. Conduit shall conform to the following:

921.07.01 Metallic Conduit.

MATERIAL	SPECIFICATION
Electrical Metallic Tubing	UL 797
Intermediate Metal Conduit	UL 1242
Rigid Metal Conduit	UL 6
Rigid Steel Conduit, Zinc Coated	ANSI C80.1
Metallic Outlet Boxes	UL 514A
Fittings for Conduit and Outlet Boxes	UL 514B

921.07.02 Nonmetallic Conduit. The manufacturer shall furnish certification as specified in TC-1.02. Each length shall be stamped or embossed with the grade or type and applicable UL or NEMA designation.

MATERIAL	SPECIFICATION
Schedule 40 and 80 Rigid Polyvinyl Chloride (PVC) Conduit	UL 651
Electrical Plastic Tubing (EPT) and Electrical Plastic Conduit (EPC-40 and EPC-80)	NEMA TC 2
Nonmetallic Outlet Boxes, Flush Device Boxes and Covers	UL 514C
Electrical Nonmetallic Conduit (ENC)	NEMA TC 13
PVC Fittings for use with Rigid PVC Conduit and Tubing	NEMA TC 3
Flexible PVC Coated Conduit	UL 360
Liquid Tight Flexible Nonmetallic Conduit for Detector Sleeves	UL 1660

921.07.03 PVC Coated Metallic Conduit.

MATERIAL	SPECIFICATION
PVC Externally Coated, Galvanized, Rigid Steel Conduit and Electrical Metallic Tubing	NEMA RN 1

921.08 STRAW BALES. Straw bales for erosion and sediment control shall conform to the Contract Documents and shall be approximately 14 x 18 x 36 in.

921.09 GEOTEXTILES.

921.09.01 Geotextile Requirements. All geotextiles shall be listed in the National Transportation Product Evaluation Program (NTPEP) for geotextiles. The geotextile shall be manufactured from fibers consisting of long chain synthetic polymers, composed of a minimum 95 percent by weight of polyolefins or polyesters. The fibers shall be formed into a stable network so that the filaments or yarns retain their dimensional stability relative to each other, including selvages. The geotextile shall conform to the following:

MARYLAND APPLICATION CLASS	TYPE OF GEOTEXTILE	GRAB STRENGTH lb D 4632	PUNCTURE STRENGTH lb D 4833	PERMITTIVITY sec ⁻¹ D 4491	APPARENT OPENING SIZE, max mm D 4751	TRAPEZOID TEAR STRENGTH lb D 4533
SD TYPE I	NONWOVEN	160	56	0.50	0.43	55
	WOVEN, MONOFILAMENT	250	90	0.50	0.43	90
TYPE II	NONWOVEN	160	56	0.20	0.25	55
	WOVEN, MONOFILAMENT	250	90	0.20	0.25	90
PE TYPE I	NONWOVEN	200	80	0.70	0.43	80
	WOVEN, MONOFILAMENT	250	90	0.70	0.43	90
TYPE II	NONWOVEN	200	80	0.20	0.25	80
	WOVEN, MONOFILAMENT	250	90	0.20	0.25	90
TYPE III	NONWOVEN	200	80	0.10	0.22	80
	WOVEN, MONOFILAMENT	250	90	0.10	0.22	90
SE	NONWOVEN	200	80	0.20	0.30	80
	WOVEN	250	90	0.20	0.30	90
ST	WOVEN	300*	110	0.05	0.15**	110
F	WOVEN	100	—	0.05	0.60	—
E	NONWOVEN	90	30	0.50	0.30	30

Note 1: All property values are based on minimum average roll values in the weakest principle direction, except for apparent opening size.

Note 2: The ultraviolet stability shall be 50 percent after 500 hours of exposure for all classes, except Class F, which shall be 70 percent (D 4355).

* Minimum 15 percent elongation.

**This is a MINIMUM apparent opening size, not a maximum.

Only those geotextiles that have been tested by NTPEP will be considered candidates for use. In addition, the geotextiles shall conform to the Contract Documents and to the Geotextile Acceptance and Quality Assurance Procedure, MSMT 732.

Geotextiles used for reinforcement applications shall have a separate approval process.

921.09.02 Seam and Overlap D 4884. When geotextiles are joined by sewing, the geotextile seam shall conform to the following:

- (a) Seams shall be either “J” or “Butterfly” type and shall utilize a lock stitch.
- (b) Seams shall conform to the tensile strength requirements for the geotextile when tested across the seam.

- (c) The durability of the thread for seaming shall be at least equal to the geotextile itself.

921.09.03 Securing Pins or Staples. Securing pins or staples shall have a minimum 10 in. length and shall be designed to securely hold the geosynthetic in place during construction.

921.10 POLYETHYLENE (PE) MANHOLES. PE manholes shall conform to D 1248, Type III, Class C, Category 3, Grade P34. Working drawings shall be submitted to the Engineer prior to fabrication.

Compressive strength shall be determined in conformance with D 2412, modified pipe stiffness test. Pipe stiffness shall be a minimum of 12 psi at 5 percent deflection, including joints. Axial compressive strength shall be a minimum of 10 000 lb at less than 3 percent deflection.

PE manholes for storm drains shall be manufactured with an invert bowl which will not interrupt flow. Manholes for sanitary sewers shall have a factory molded invert for channeled flow.

The manufacturer shall furnish certification as specified in TC-1.02. The certification shall accompany each shipment of PE manholes and shall show actual test results, the quantity of manhole sections, and date of manufacture. Manholes shall be marked with the manufacturer's name and trademark.

921.11 PREFORMED FIBERGLASS. Preformed fiberglass shall conform to the following:

TEST PROPERTY	TEST METHOD	SPECIFICATION LIMITS
Density, g/cm, min	D 792	1.25
Absorption, % max	D 570	1.0
Tensile Strength, average of five specimens each direction*, psi min	D 638	10 000
Thickness (unless otherwise specified), in.	—	3/16
Thickness Tolerance, in.	—	+1/16, -0
Color No.	Fed. Std. 595	26622

* Longitudinal and transverse directions.